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RAW SEQUENCE LISTING
PATENT APPLICATION: US/10/081,872

DATE: 10/07/2002
TIME: 16:57:42

Input Set : A:\09010-108001.TXT
Output Set: N:\CRF4\10072002\J081872.raw

4 <110> APPLICANT: Callen, Walter
5 Richardson, Toby
6 Frey, Gerhard
7 Short, Jay M.
8 Mathur, Eric J.
9 Gray, Kevin A.
10 Kerovuo, Janne S.
11 Slupska, Malgorzata
13 <120> TITLE OF INVENTION: ENZYMES HAVING ALPHA AMYLASE ACTIVITY
14 AND METHODS OF USE THEREOF
16 <130> FILE REFERENCE: 09010-108001
18 <140> CURRENT APPLICATION NUMBER: US 10/081,872
19 <141> CURRENT FILING DATE: 2002-02-21
21 <150> PRIOR APPLICATION NUMBER: US 60/270,495
22 <151> PRIOR FILING DATE: 2001-02-21
24 <150> PRIOR APPLICATION NUMBER: US 60/270,496
25 <151> PRIOR FILING DATE: 2001-02-21
27 <150> PRIOR APPLICATION NUMBER: US 60/291,122
28 <151> PRIOR FILING DATE: 2001-05-14
30 <160> NUMBER OF SEQ ID NOS: 321
32 <170> SOFTWARE: FastSEQ for Windows Version 4.0
34 <210> SEQ ID NO: 1
35 <211> LENGTH: 1311
36 <212> TYPE: DNA
37 <213> ORGANISM: Artificial Sequence
39 <220> FEATURE:
40 <223> OTHER INFORMATION: synthetically generated oligonucleotide
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45 gccgggattt cggcgatatg gattcccccg gcgagcaagg gcatgggcgg cgcctattcg 180
46 atgggctacg acccctacga cttctttgac ctcggtgagt acgaccagaa gggaacggta 240
47 gagacgcgct ttgggtccaa gcaggagctc gtgaacatga taaacaccgc ccacgcctat 300
48 ggcatgaagg taatagccga tatagtcatc aaccaccgcg ccggcggtga cctggagtgg 360
49 aacccttcg tgaacgacta tacctggacc gacttctcaa aggtcgcgctc gggtaaatac 420
50 acggccaact acctcgactt ccaccgaac gagctccatg cgggcgattc cggaacattt 480
51 ggaggctatc ccgacatatg ccacgacaag agctgggacc agtactggct ctgggccagc 540
52 caggagagct acgcggcata tctcaggagc atcggcatcg atgcctggcg cttcgactac 600
53 gtcaagggct acggagcgtg ggtcgtcaag gactggctgg actggtgggg aggctgggcc 660
54 gtcggggagt actgggacac aaacgttgat gactgctca actgggccta ctcgagcgat 720
55 gcaaaagtct tcgacttccc gctctactac aagatggacg cggcctttga caacaagaac 780
56 attcccgac tcgtcgaggc cctcaagaac gggggcacag tcgtcagccg cgaccggtt 840
57 aaggccgtaa ccttcgttgc aaaccacgac accgatataa tctggaacaa gtatccagcc 900

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59 tggctcaaca aggataagct caagaacctc atctggatac atgacaacct cgccggagga      1020
60 agcactgaca tcgtttacta cgacaacgac gagctgatat tcgtgagaaa cggctacgga      1080
61 agcaagccgg gactgataac atacatcaac ctgcctcaa gcaaagccgg aaggtgggtt      1140
62 tacgttccga agttcgagg ctcgtgcata cacgagtaca ccggcaatct cggcggctgg      1200
63 gtggacaagt ggggtggactc aagcggctgg gtctacctcg aggctcctgc ccacgacccg      1260
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72 <223> OTHER INFORMATION: synthetically generated polypeptide
74 <400> SEQUENCE: 2
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77 Phe Tyr Trp Asp Val Pro Met Gly Gly Ile Trp Trp Asp Thr Ile Ala
78 20 25 30
79 Gln Lys Ile Pro Asp Trp Ala Ser Ala Gly Ile Ser Ala Ile Trp Ile
80 35 40 45
81 Pro Pro Ala Ser Lys Gly Met Gly Gly Ala Tyr Ser Met Gly Tyr Asp
82 50 55 60
83 Pro Tyr Asp Phe Phe Asp Leu Gly Glu Tyr Asp Gln Lys Gly Thr Val
84 65 70 75 80
85 Glu Thr Arg Phe Gly Ser Lys Gln Glu Leu Val Asn Met Ile Asn Thr
86 85 90 95
87 Ala His Ala Tyr Gly Met Lys Val Ile Ala Asp Ile Val Ile Asn His
88 100 105 110
89 Arg Ala Gly Gly Asp Leu Glu Trp Asn Pro Phe Val Asn Asp Tyr Thr
90 115 120 125
91 Trp Thr Asp Phe Ser Lys Val Ala Ser Gly Lys Tyr Thr Ala Asn Tyr
92 130 135 140
93 Leu Asp Phe His Pro Asn Glu Leu His Ala Gly Asp Ser Gly Thr Phe
94 145 150 155 160
95 Gly Gly Tyr Pro Asp Ile Cys His Asp Lys Ser Trp Asp Gln Tyr Trp
96 165 170 175
97 Leu Trp Ala Ser Gln Glu Ser Tyr Ala Ala Tyr Leu Arg Ser Ile Gly
98 180 185 190
99 Ile Asp Ala Trp Arg Phe Asp Tyr Val Lys Gly Tyr Gly Ala Trp Val
100 195 200 205
101 Val Lys Asp Trp Leu Asp Trp Trp Gly Gly Trp Ala Val Gly Glu Tyr
102 210 215 220
103 Trp Asp Thr Asn Val Asp Ala Leu Leu Asn Trp Ala Tyr Ser Ser Asp
104 225 230 235 240
105 Ala Lys Val Phe Asp Phe Pro Leu Tyr Tyr Lys Met Asp Ala Ala Phe
106 245 250 255
107 Asp Asn Lys Asn Ile Pro Ala Leu Val Glu Ala Leu Lys Asn Gly Gly
108 260 265 270
109 Thr Val Val Ser Arg Asp Pro Phe Lys Ala Val Thr Phe Val Ala Asn

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110          275          280          285
111 His Asp Thr Asp Ile Ile Trp Asn Lys Tyr Pro Ala Tyr Ala Phe Ile
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113 Leu Thr Tyr Glu Gly Gln Pro Thr Ile Phe Tyr Arg Asp Tyr Glu Glu
114 305          310          315          320
115 Trp Leu Asn Lys Asp Lys Leu Lys Asn Leu Ile Trp Ile His Asp Asn
116          325          330          335
117 Leu Ala Gly Gly Ser Thr Asp Ile Val Tyr Tyr Asp Asn Asp Glu Leu
118          340          345          350
119 Ile Phe Val Arg Asn Gly Tyr Gly Ser Lys Pro Gly Leu Ile Thr Tyr
120          355          360          365
121 Ile Asn Leu Ala Ser Ser Lys Ala Gly Arg Trp Val Tyr Val Pro Lys
122          370          375          380
123 Phe Ala Gly Ser Cys Ile His Glu Tyr Thr Gly Asn Leu Gly Gly Trp
124 385          390          395          400
125 Val Asp Lys Trp Val Asp Ser Ser Gly Trp Val Tyr Leu Glu Ala Pro
126          405          410          415
127 Ala His Asp Pro Ala Asn Gly Gln Tyr Gly Tyr Ser Val Trp Ser Tyr
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129 Cys Gly Val Gly
130          435
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133 <211> LENGTH: 1311
134 <212> TYPE: DNA
135 <213> ORGANISM: Artificial Sequence
137 <220> FEATURE:
138 <223> OTHER INFORMATION: synthetically generated oligonucleotide
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142 gtcccatgag gaggaatctg gtgggacacg atagcccaga agatacccgga ctgggcaagc 120
143 gccgggattt cggcgatatg gattcccccg gcgagcaagg gcatgggcgg cgcctattcg 180
144 atgggctacg acccctacga cttctttgac ctcggtgagt acgaccagaa gggaacggta 240
145 gagacgcgct ttgggtccaa gcaggagctc gtgaacatga taaacaccgc ccacgcctac 300
146 ggcatacaag tcatgcgaga catagtaatc aaccaccgcg ccggaggaga ccttgagtgg 360
147 aaccccttcg tcaatgacta cacctggacg gacttctcga aggtcgcttc cggcaagtac 420
148 acggccaatt acctcgactt ccaccggaac gagctccatg cgggcgattc cggaacattt 480
149 ggaggctatc ccgacatatg ccacgacaag agctgggacc agtactggct ctgggccagc 540
150 caggagagct acgcggcata tctcaggagc atcggcacat atgcctggcg cttcgactac 600
151 gtcaagggtc atgctccctg ggtcgtcaag gactggctga actggtgggg aggctgggcg 660
152 gttggagagt actgggacac caacgtcgac gctgttctca actgggcata ctcgagcggt 720
153 gccaaaggtc ttgacttcgc cctctactac aagatggatg aggcctttga caacaaaaac 780
154 attccagcgc tcgtctctgc ccttcagaac ggccagactg ttgtctcccg cgaccggttc 840
155 aaggccgtaa cctttgtagc aaaccacgac accgatataa tctggaacaa gtatccagcc 900
156 tacgcgttca tctcaccta cgagggccag ccgacaatat tctaccgga ctacgaggag 960
157 tggtcacaac aggataagct caagaacctc atctggatac atgacaacct cgccggagga 1020
158 agcaactgac tcgtttacta cgacaacgac gagctgatat tcgtgagaaa cggctacgga 1080
159 agcaagccgg gactgataac atacatcaac ctgcctcaa gcgaagccgg aaggtgggtc 1140
160 tacgttccga agttcgcggg agcgtgcac cagagtaca ccggcaacct cggcggtcgg 1200
161 gtggacaagt ggggtgactc aagcgggtgg gtgtacctcg aggccctgc ccacgacctg 1260

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1311

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162 gccaaacggct attacggcta ctccgtctgg agctattgcg gtgttggtg a
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165 <211> LENGTH: 436
166 <212> TYPE: PRT
167 <213> ORGANISM: Artificial Sequence
169 <220> FEATURE:
170 <223> OTHER INFORMATION: synthetically generated polypeptide
172 <400> SEQUENCE: 4
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175 Phe Tyr Trp Asp Val Pro Met Gly Gly Ile Trp Trp Asp Thr Ile Ala
176 20 25 30
177 Gln Lys Ile Pro Asp Trp Ala Ser Ala Gly Ile Ser Ala Ile Trp Ile
178 35 40 45
179 Pro Pro Ala Ser Lys Gly Met Gly Gly Ala Tyr Ser Met Gly Tyr Asp
180 50 55 60
181 Pro Tyr Asp Phe Phe Asp Leu Gly Glu Tyr Asp Gln Lys Gly Thr Val
182 65 70 75 80
183 Glu Thr Arg Phe Gly Ser Lys Gln Glu Leu Val Asn Met Ile Asn Thr
184 85 90 95
185 Ala His Ala Tyr Gly Ile Lys Val Ile Ala Asp Ile Val Ile Asn His
186 100 105 110
187 Arg Ala Gly Asp Leu Glu Trp Asn Pro Phe Val Asn Asp Tyr Thr
188 115 120 125
189 Trp Thr Asp Phe Ser Lys Val Ala Ser Gly Lys Tyr Thr Ala Asn Tyr
190 130 135 140
191 Leu Asp Phe His Pro Asn Glu Leu His Ala Gly Asp Ser Gly Thr Phe
192 145 150 155 160
193 Gly Gly Tyr Pro Asp Ile Cys His Asp Lys Ser Trp Asp Gln Tyr Trp
194 165 170 175
195 Leu Trp Ala Ser Gln Glu Ser Tyr Ala Ala Tyr Leu Arg Ser Ile Gly
196 180 185 190
197 Ile Asp Ala Trp Arg Phe Asp Tyr Val Lys Gly Tyr Ala Pro Trp Val
198 195 200 205
199 Val Lys Asp Trp Leu Asn Trp Trp Gly Gly Trp Ala Val Gly Glu Tyr
200 210 215 220
201 Trp Asp Thr Asn Val Asp Ala Val Leu Asn Trp Ala Tyr Ser Ser Gly
202 225 230 235 240
203 Ala Lys Val Phe Asp Phe Ala Leu Tyr Tyr Lys Met Asp Glu Ala Phe
204 245 250 255
205 Asp Asn Lys Asn Ile Pro Ala Leu Val Ser Ala Leu Gln Asn Gly Gln
206 260 265 270
207 Thr Val Val Ser Arg Asp Pro Phe Lys Ala Val Thr Phe Val Ala Asn
208 275 280 285
209 His Asp Thr Asp Ile Ile Trp Asn Lys Tyr Pro Ala Tyr Ala Phe Ile
210 290 295 300
211 Leu Thr Tyr Glu Gly Gln Pro Thr Ile Phe Tyr Arg Asp Tyr Glu Glu
212 305 310 315 320
213 Trp Leu Asn Lys Asp Lys Leu Lys Asn Leu Ile Trp Ile His Asp Asn

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214          325          330          335
215 Leu Ala Gly Gly Ser Thr Asp Ile Val Tyr Tyr Asp Asn Asp Glu Leu
216          340          345          350
217 Ile Phe Val Arg Asn Gly Tyr Gly Ser Lys Pro Gly Leu Ile Thr Tyr
218          355          360          365
219 Ile Asn Leu Ala Ser Ser Glu Ala Gly Arg Trp Val Tyr Val Pro Lys
220          370          375          380
221 Phe Ala Gly Ala Cys Ile His Glu Tyr Thr Gly Asn Leu Gly Gly Trp
222 385          390          395          400
223 Val Asp Lys Trp Val Asp Ser Ser Gly Trp Val Tyr Leu Glu Ala Pro
224          405          410          415
225 Ala His Asp Pro Ala Asn Gly Tyr Tyr Gly Tyr Ser Val Trp Ser Tyr
226          420          425          430
227 Cys Gly Val Gly
228          435
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231 <211> LENGTH: 1311
232 <212> TYPE: DNA
233 <213> ORGANISM: Artificial Sequence
235 <220> FEATURE:
236 <223> OTHER INFORMATION: synthetically generated oligonucleotide
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241 gcgggaatat ccgccatttg gattcccccg gcaagcaagg gcatgggcgg cgcctattcg      180
242 atgggctacg acccctacga cttctttgac ctcggtgagt acgaccagaa gggaacggta      240
243 gagacgcgct ttggctccaa gcaggagctc gtgaacatga taaacaccgc ccacgcctat      300
244 ggcataaagg taatagccga tatagtcata aaccaccgcg ccggcggtga cctggagtg      360
245 aaccccttcg tgaacgacta tacctggacc gactttctca aggtcgcgtc gggtaaatac      420
246 acggccaact acctcgactt ccacccgaac gagctccatg cgggcgattc cggaacattt      480
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259 gtagacaagt acgtctactc aagcggctgg gtctatctcg aagctccagc ttacgaccct      1260
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262 <210> SEQ ID NO: 6
263 <211> LENGTH: 436
264 <212> TYPE: PRT
265 <213> ORGANISM: Artificial Sequence
267 <220> FEATURE:

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VERIFICATION SUMMARY

DATE: 10/07/2002

PATENT APPLICATION: US/10/081,872

TIME: 16:57:43

Input Set : A:\09010-108001.TXT

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